

WHAT IS CLAIMED IS:

- 1 1. A composition for producing colored synthetic fiber having improved color
2 strength and dimensional stability, the composition comprising:
3 a) at least one fiber-forming polyamide,
4 b) at least one thermoplastic polyester, said thermoplastic polyester being present
5 at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide
6 and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-
7 forming polyamide,
8 c) a colorant system comprising at least one colorant selected from the group
9 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
10 organic pigments.

- 1 2. The composition of claim 1 wherein said colorant system includes at least one
2 carrier resin for said colorant.

- 1 3. The composition of claim 1 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.

- 1 4. The composition of claim 1 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6 and polyamide 6,6.

- 1 5. The composition of claim 1 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

- 1 6. The composition of claim 1 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

7. The composition of claim 1 wherein said at least one said thermoplastic polyester is present at between about 15 weight % and about 35 weight % with respect to the total weight of the composition.

8. The composition of claim 1 wherein said at least one colorant is selected from the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines, quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and perylenes.

9. The composition of claim 8 wherein said colorant is selected from the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide, Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60, Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272, Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

10. The composition of claim 1 wherein said colorant is present at between about 0.1 weight % and about 8 weight % of the composition.

11. The composition of claim 2 wherein the at least one carrier resin is selected from the group consisting of polyamides, polyesters, sulphonated polyesters, and copolymers, blends and mixtures thereof.

12. The composition of claim 2 wherein said at least one carrier resin is a metal sulphonate polyester.

13. The composition of claim 12 wherein said metal sulphonate polyester is selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and blends and mixtures thereof.

1 14. The composition of claim 1, further comprising at least one adjuvant.

1 15. The composition of claim 14, wherein said at least one adjuvant is selected from
2 the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-
3 retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,
4 lubricant, melt viscosity enhancer, or mixtures thereof.

1 16. A composition for producing colored synthetic fiber having improved color
2 strength and dimensional stability, the composition comprising:

3 a) at least one fiber-forming polyamide,

4 b) at least one thermoplastic polyester, said thermoplastic polyester being present
5 at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide
6 and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-
7 forming polyamide,

8 c) a colorant system comprising at least one colorant selected from the group
9 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
10 organic pigments,

11 d) at least one polymeric compatibilising additive.

1 17. The composition of claim 16 wherein said colorant system includes at least one
2 carrier resin for said colorant.

1 18. The composition of claim 16 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.

1 19. The composition of claim 16 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6 and polyamide 6,6.

1 20. The composition of claim 16 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of polyalkylene terephthalates, polyalkylene

3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 21. The composition of claim 16 wherein said at least thermoplastic polyester is
2 selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 22. The composition of claim 16 wherein said at least one thermoplastic polyester is
2 present at between about 15 weight % and about 35 weight % with respect to the total
3 weight of the composition.

1 23. The composition of claim 16 wherein said at least one polymeric compatibiliser
2 additive is a metal sulphonate polyester.

1 24. The composition of claim 16 wherein said at least one polymeric compatibiliser
2 additive is selected from the group consisting of alkali metal salts of poly(ethylene
3 terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-
4 sulphoisophthalate), and blends and mixtures thereof.

1 25. The composition of claim 23 wherein said metal sulphonate polyester is present
2 between 1 weight % and 25 weight % of the composition.

1 26. The composition of claim 23 wherein said metal sulphonate polyester is added in
2 an amount such that the composition has between about 300 and about 3500 ppm
3 sulphur.

1 27. The composition of claim 16 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 28. The composition of claim 16 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 29. The composition of claim 16 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 30. The composition of claim 17 wherein said at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 31. The composition of claim 17 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

1 32. The composition of claim 31 wherein said metal sulphonate polyester is selected
2 from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-
3 sulphisophthalate) and poly(butylene terephthalate-co-sulphisophthalate), and
4 blends and mixtures thereof.

1 33. The composition of claim 16, further comprising at least one adjuvant.

1 34. The composition of claim 33, wherein said at least one adjuvant is selected from
2 the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-
3 retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,
4 lubricant, melt viscosity enhancer, or mixtures thereof.

1 35. A process for producing colored synthetic fiber composition, with improved color
2 strength and dimensional stability, the process comprising:

3 (1) melt blending:

- 4 a) at least one fiber-forming polyamide,
- 5 b) at least one thermoplastic polyester, said at least one thermoplastic polyester
- 6 being present at a ratio of less than 2:1 by weight with respect to said at least one
- 7 fiber-forming polyamide and forming a dispersed, non-continuous, minor phase in a
- 8 matrix of said at least one fiber-forming polyamide,
- 9 c) a colorant system comprising at least one colorant selected from the group
- 10 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
- 11 organic pigments;
- 12 (2) forming said melt blend into filaments; and
- 13 (3) drawing said filaments into fibers.

1 36. A process according to claim 35 wherein said colorant system employed in the
2 step of melt blending includes at least one carrier resin for said colorant.

1 37. A process according to claim 35 comprising the further step of texturing said
2 fibers subsequent to drawing said filaments into fibers.

1 38. A process according of claim 35 wherein said at least one fiber-forming polyamide
2 is selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.

1 39. A process according to claim 35 wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1 40. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 41. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is selected from the group consisting of poly(ethylene terephthalate), poly(propylene

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3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 42. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is present at between about 15 weight % and about 35 weight % with respect to the
3 total weight of the composition.

1 43. A process according to claim 35 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 44. A process according to claim 35 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 45. A process according to claim 35 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 46. A process according to claim 36 wherein the at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 47. A process according to claim 36 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

1 48. A process according to claim 47 wherein said metal sulphonate polyester is
2 selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-

3 co-sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and
4 blends and mixtures thereof.

1 49. A process according to claim 35 including the further step of adding at least one
2 adjuvant.

1 50. A process according to claim 49 wherein said at least one adjuvant is selected
2 from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial,
3 flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic
4 additive, lubricant, melt viscosity enhancer, or mixtures thereof.

1 51. A process according to claim 35 wherein a draw ratio in said drawing step is from
2 1.05 to 7.00.

1 52. A process according to claim 35 wherein a draw ratio in said drawing step is from
2 1.10 to 6.00.

1 53. A fiber made from the process of claim 35.

1 54. A fiber made from the process of claim 37.

1 55. A fiber made from the process of claim 48.

1 56. A fiber made from the process of claim 35 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta and trilobal.

1 57. A fiber made from the process of claim 37 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal.

1 58. A fiber made from the process of claim 48 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal

1 59. A woven, knitted or pile textile article made from the fiber of claim 53.

1 60. A woven, knitted or pile textile article made from the fiber of claim 54.

1 61. A woven, knitted or pile textile article made from the fiber of claim 55.

1 62. A carpet or floorcovering made from the fiber of claim 53.

1 63. A carpet or floorcovering made from the fiber of claim 54.

1 64. A carpet or floorcovering made from the fiber of claim 55.

1 65. A fiber made from the composition of claim 1.

1 66. A fiber made from the composition of claim 13.

1 67. A fiber made from the composition of claim 16.

1 68. A fiber made from the composition of claim 24.

1 69. A process for producing colored synthetic fiber composition, with improved color
2 strength and dimensional stability, the process comprising:

3 (1) melt blending:

4 a) at least one fiber-forming polyamide,

5 b) at least one thermoplastic polyester, said at least one thermoplastic
6 polyester being present at a ratio of less than 2:1 by weight with respect
7 to said at least one fiber-forming polyamide and forming a dispersed,
8 non-continuous, minor phase in a matrix of said at least one fiber-
9 forming polyamide,

10 c) a colorant system comprising at least one colorant selected from the
11 group consisting of inorganic pigments, organic pigments, and
12 mixtures of inorganic and organic pigments;

13 d) at least one polymeric compatibilising additive;

14 (2) forming said melt blend into filaments; and

15 (3) drawing said filaments into fibers.

1 70. A process according to claim 69, wherein said colorant system employed in the
2 step of melt blending includes at least one carrier resin for said colorant.

1 71. A process according to claim 69, comprising the further step of texturing said
2 fibers subsequent to drawing said filaments into fibers.

1 72. A process according to claim 69, wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6, polyamide 11,
3 polyamide 12, polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers,
4 blends and mixtures thereof.

1 73. A process according to claim 69, wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1 74. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 75. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 76. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is present at between about 15 weight % and about 35 weight % with respect to the
3 total weight of the composition.

1 77. A process according to claim 69 wherein said at least one polymeric
2 compatibiliser additive is a metal sulphonate polyester.

1 78. A process according to claim 69 wherein said at least one polymeric
2 compatibiliser additive is selected from the group consisting of alkali metal salts of

3 poly(ethylene terephthalate-*co*-sulphoisophthalate) and poly(butylene terephthalate-
4 *co*-sulphoisophthalate), and blends and mixtures thereof.

1 79. A process according to claim 77 wherein said metal sulphonate copolymer is
2 present at between about 1 weight % and about 25 weight % of the melt blend.

1 80. A process according to claim 77 wherein said metal sulphonate polyester is added
2 in an amount such that the melt blend has between about 300 and about 3500 ppm
3 sulphur.

1 81. A process according to claim 69 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulfo-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 82. A process according to claim 69 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 83. A process according to claim 69 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 84. A process according to claim 70 wherein the at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 85. A process according to claim 70 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

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86. A process according to claim 85 wherein said metal sulphonate polyester is selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and blends and mixtures thereof.

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87. A process according to claim 69 including the further step of adding at least one adjuvant.

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88. A process according to claim 87 wherein said at least one adjuvant is selected from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial, flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive, lubricant, melt viscosity enhancer, or mixtures thereof.

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89. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.05 to 7.00.

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90. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.10 to 6.00.

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91. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.05 to 7.00.

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92. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.10 to 6.00.

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93. A fiber made from the process of claim 69.

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94. A fiber made from the process of claim 71.

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95. A fiber made from the process of claim 86.

